

Appl. No. 10/071,938
Amdt. dated Aug. 19, 2005
Reply to Office Action of Apr. 19, 2005

Amendments to the Specification:

Please replace paragraph 0005 (page 1, lines 18-22) with the following amended paragraph:

[0005] Furthermore, conventional portable electronic devices do not provide many options for a device user to alter the appearance of the portable electronic device once manufactured. Accessories, such as device cases, do provide some appearance differentiation;[[,]] however, they tend to add size and weight to the portable device while providing a limited effect on the overall appearance.

Please replace paragraph 0006 (page 2, lines 1-9) with the following amended paragraph:

[0006] Differentiating the appearance of individual portable electronic devices has become an important requirement for the customer, the manufacturer, and the distributor of such devices. Customers desire a unique appearance to satisfy their tastes and preferences. Customers further desire the ability to change the appearance of their portable electronic devices ~~device~~ for variety,[[,]] and to match their moods, environment etc. Manufacturers desire a unique appearance to provide variety to their customers and to distinguish their products from competitors' ~~competitor's~~ products. Distributors desire a unique appearance to distinguish their products ~~product~~ in the marketplace and to promote their brand name.

Please replace paragraph 0008 (page 2, lines 14-22) with the following amended paragraph:

[0008] Some device manufacturers now offer interchangeable covers to provide customizable decorative ornaments for a portable electronic device. One example can be found in United States Patent No. ~~patent number~~ 5,745,566, issued April 28, 1998 to Petrella et al. and entitled ~~itled~~ "Portable Communication Device Having Removable Escutcheon Elements," which patent is assigned to the assignee of the present invention[[,]] and ~~which is~~ incorporated by reference herein. A benefit of these interchangeable covers is the additional protection they provide for the electronics contained within the portable electronic device. A device user can easily change the

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device appearance with these customizable covers, typically available in an assortment of colors and patterns.

Please replace paragraph 0009 (page 3, lines 1-8) with the following amended paragraph:

[0009] Similarly, some device manufacturers offer interchangeable faceplates accommodating differing sizes, shapes, and locations of buttons and displays of the portable electronic device. One example can be found in United States Patent No. ~~patent number~~ 5,884,772, issued March 23, 1999 to Floyd et al. and ~~entitled~~ titled "Electronic Device Having Multiple User Interface Configurations," which ~~patent~~ is assigned to the assignee of the present invention[[,]] and ~~which~~ is incorporated by reference herein. Utilization of such faceplates provides flexibility and manufacturing cost reductions;[[,]] however, the appearance of the portable electronic device remains fixed for the device user.

Please replace paragraph 0012 (page 3, lines 21-23) with the following amended paragraph:

[0012] The present invention will be described by way of exemplary embodiments, but not limitations, illustrated in the accompanying drawings in which like reference numerals ~~references~~ denote similar elements, and in which:

Please replace paragraph 0015 (page 4, lines 6-8) with the following amended paragraph:

[0015] FIGs. 3 to 5 are illustrations of various embodiments of the portable electronic device of FIG. 1 in accordance with alternative embodiments ~~a preferred embodiment~~ of the present invention; and

Please replace paragraph 0016 (page 4, lines 10-12) with the following amended paragraph:

[0016] FIG. 6 is a cross sectional view of a housing for use in the portable electronic device of FIGs. 1-5 in accordance with yet another ~~a preferred~~ embodiment of the present invention.

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Please replace paragraph 0017 (page 4, line 16 through page 5, line 2) with the following amended paragraph:

[0017] As required, detailed embodiments of the present invention are disclosed herein; however, it is to be understood that the disclosed embodiments are merely exemplary of the invention, which can be embodied in various forms. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but rather should be interpreted merely as a basis for the claims and as a representative basis for teaching one skilled in the art to variously employ the present invention in virtually any appropriately detailed structure. Further, the terms and phrases used herein are not intended to be limiting; but rather~~[[,]]~~ are intended to provide an understandable description of the invention.

Please replace paragraph 0018 (page 5, lines 3-18) with the following amended paragraph:

[0018] Referring to FIG. 1, a portable electronic device 10 is illustrated. The portable electronic device 10 includes a housing 12 having an outer visible surface 14. The housing 12 is preferably manufactured by a plastic injection molding technique as is well known in the art. By way of example, the preferred embodiment of the present invention is described in relation to a fixed housing, such as the housing 12 of FIG. 1; however, it will be appreciated by one of ordinary skill in the art that the present invention is similarly applicable to a removable housing accessory, such as the removable faceplate described in United States Patent No. ~~patent number~~ 5,884,772, issued March 23, 1999 to Floyd et al. and entitled ~~titled~~ "Electronic Device Having Multiple User Interface Configurations," which patent is assigned to the assignee of the present invention~~[[,]]~~ and ~~which is~~ incorporated by reference herein. Similarly, the present invention is equally applicable to interchangeable covers for housings, such as described in United States Patent No. ~~patent number~~ 5,745,566, issued April 28, 1998 to Petrella et al. and entitled ~~titled~~ "Portable Communication Device Having Removable Escutcheon Elements," which patent is assigned to the assignee of the present invention~~[[,]]~~ and ~~which is~~ incorporated by reference herein.

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Please replace paragraph 0019 (page 5, line 19 through page 6, line 5) with the following amended paragraph:

[0019] Preferably, in accordance with the present invention, the outer visible surface is composed of an appearance changing substance. The appearance changing substance provides a means by which the physical environment of the portable electronic device 10 or external physical environment stimuli causes a change to the decorative appearance of the outer visible surface 14 of the housing 12. The appearance changing substance ~~for example,~~ can be, for example, a color changing substance, a pattern changing substance, an illumination producing substance, a shape changing substance, and a sensory producing substance or any combination ~~thereof therein~~. It will be appreciated by one of ordinary skill in the art that the appearance changing substance can be any of those substances mentioned herein or an equivalent.

Please replace paragraph 0020 (page 6, lines 6-13) with the following amended paragraph:

[0020] When the appearance changing substance is a sensory producing substance, it can be a thermal producing substance, a vibration producing substance, and a haptic producing substance, or any combination ~~thereof therein~~. For example, the appearance changing substance can cause the housing 12 to interact with the muscles and tendons that give the human a sensation of a force being applied. Similarly, the housing 12 can interact with the nerve endings in the skin that indicate heat, pressure, and texture. It will be appreciated by one of ordinary skill in the art that the sensory producing substance can be any of those substances mentioned herein or an equivalent.

Please replace paragraph 0021 (page 6, line 14 through page 7, line 5) with the following amended paragraph:

[0021] The appearance changing substance ~~for example~~ can utilize, for example, thermochromic pigments whereby heat results in changing colors. The thermal change can be due to a hot environment or the body heat of the device user. Specifically, the appearance changing

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substance can be composed of thermotropic liquid crystals. These liquid crystal molecules can change position, or twist, according to changes in temperature. This change in molecular structure affects the wavelengths of light that are absorbed or reflected by the liquid. For example, as the temperature increases, the liquid crystal molecules twist in one direction. This twist causes the liquid crystal substance to absorb more of the red and green portions of the visible light, and reflect the blue part. The result is that the housing 12 appears to be dark blue. When the temperature decreases, the molecules twist in the other direction[[,]] and reflect a different portion of the spectrum, causing the housing 12 to appear as a different color. It will be appreciated by one of ordinary skill in the art that, alternatively, the appearance changing substance can be a leuco dye rather than a liquid crystal, or an equivalent thermochromic technology.

Please replace paragraph 0023 (page 7, lines 12-23) with the following amended paragraph:

[0023] Each of the appearance changing substances, in accordance with a preferred embodiment of the present invention, is responsive to an environmental stimulus. The environmental stimulus, ~~for example,~~ can be, for example, an acoustic stimulus, a thermal stimulus, an electrical stimulus, an electromagnetic stimulus, a mechanical stimulus, an olfactory stimulus, or any combination thereof. It will be appreciated by one of ordinary skill in the art that the environmental stimulus can be any of those stimuli mentioned herein or an equivalent. Further, it will be appreciated by one of ordinary skill in the art that the environmental stimulus can be generated internally or externally to the portable electronic device 10. For example, environmental vibrations, noise, music, sunlight, body heat, etc. emanating from outside of the device would encounter the housing 12 of the portable electronic device 10 and result in changing its appearance in a decorative or informative manner.

Please replace paragraph 0024 (page 8, lines 1-5) with the following amended paragraph:

[0024] An electrical stimulus can include a communication message transmitted to the portable electrical device 10 by a service provider, as is well known in the art. Further, an electrical

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stimulus can include ~~included~~ a user input to the portable electronic device 10, such as a device user pressing a button or series of buttons on the portable electronic device 10.

Please replace paragraph 0026 (page 8, lines 11-22) with the following amended paragraph:

[0026] In one embodiment, the sensitivity of the appearance changing substance can be adjusted or turned on or off. For example, the portable electronic device 10 can include manual sensitivity switches or software algorithms that allow the device user to adjust the sensitivity of the appearance changing substance as desired. Similarly, the response of the appearance changing substance can be customized by the device user or selected from a plurality of responses. Further, in accordance with the present invention, the response of the appearance changing substance can be dynamically controlled either by a processor internal to the portable electronic device 10, a computer external to the portable electronic device 10, via receipt of a communication message either wirelessly or through a wired line, or any combination or equivalent thereof ~~therein~~. Dynamically controlling the response of the appearance changing substance provides a method for animations, messages, user customizable looks, and the like.

Please replace paragraph 0028 (page 9, lines 13-21) with the following amended paragraph:

[0028] As illustrated in FIG. 2, the portable electronic device 10 further includes at least one resistive element 18. Preferably, the ~~at least one~~ resistive element(s) ~~element~~ 18 is energized to generate a thermal stimulus in which the outer visible surface 14 of the housing 12 responds. The appearance of the outer visible surface 14, ~~for example,~~ can be actively controlled, for example, by mating the at least one resistive element 18 to the housing 12 and selectively sending current from ~~[[by]]~~ the plurality of internal components 16 to the ~~at least one~~ resistive element 18 to produce a thermal stimulus, thereby generating ~~and generate~~ a response by the appearance changing substance to change the appearance of the outer visible surface 14.

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Please replace paragraph 0029 (page 9, line 22 through page 10, line 2) with the following amended paragraph:

[0029] FIG. 3 is an illustration of one embodiment of the portable electronic device 10 of FIGs. 1 and 2 in accordance with an alternative a preferred embodiment of the present invention. As illustrated in FIG. 3, the outer visible surface 14 of the housing 12 includes a shape element 22.

Please replace paragraph 0030 (page 10, lines 3-11) with the following amended paragraph:

[0030] As illustrated in FIG. 4, the shape element 22 can be ~~an at least one~~ identification information 24. For example, the ~~at least one~~ identification information 24 can be ~~[[an]]~~ identification data, an identification code, an identification pattern, an identification image, or any combination thereof ~~therein~~. It will be appreciated by one of ordinary skill in the art that the ~~at least one~~ identification information 24 can be any of the identification information mentioned herein or an equivalent. In accordance with the present invention, the identification information 24 can become visible, for example, when exposed to ultraviolet light for anti-counterfeiting and security measures.

Please replace paragraph 0031 (page 10, lines 12-18) with the following amended paragraph:

[0031] As illustrated in FIG. 5, the shape element 22 can be an environment index gauge 26. For example, the environment index gauge 26 can be an ultraviolet light gauge, a temperature gauge, an acoustic gauge, or any combination thereof ~~therein~~. It will be appreciated by one of ordinary skill in the art that the environment index gauge 26 can be any of the gauges mentioned herein or an equivalent. The environment index gauge 26 provides potential environmental warnings to the device user to aid in protection of the device user from harmful environmental factors.

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Please replace paragraph 0032 (page 10, line 19 through page 11, line 2) with the following amended paragraph:

[0032] Referring to FIGs. 3 to 5, preferably, in accordance with the present invention, the shape element 22 is composed of an appearance changing substance. The appearance changing substance ~~for example, can be, for example,~~ a color changing substance, a pattern changing substance, an illumination producing substance, a shape changing substance, and a sensory producing substance or any combination thereof therein. It will be appreciated by one of ordinary skill in the art that the appearance changing substance can be any of those substances mentioned herein or an equivalent.

Please replace paragraph 0033 (page 11, lines 3-7) with the following amended paragraph:

[0033] The sensory producing substance can be a thermal producing substance, a vibration producing substance, and a haptic producing substance, or any combination thereof therein. It will be appreciated by one of ordinary skill in the art that the sensory producing substance can be any of those substances mentioned herein or an equivalent.

Please replace paragraph 0034 (page 11, lines 8-15) with the following amended paragraph:

[0034] Each of the appearance changing substances, in accordance with a preferred embodiment of the present invention, is responsive to an environmental stimulus. The environmental stimulus, ~~for example, can be, for example,~~ an acoustic stimulus, a thermal stimulus, an electrical stimulus, an electromagnetic stimulus, a mechanical stimulus, an olfactory stimulus, or any combination thereof. It will be appreciated by one of ordinary skill in the art that the environmental stimulus can be any of those substances mentioned herein or an equivalent. For example, the shape element 22 can be located near the surface of the housing 12 and act as a heat sink.

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Please replace paragraph 0035 (page 11, lines 16-20) with the following amended paragraph:

[0035] In one embodiment of the present invention, the shape element 22 includes ~~with~~ the appearance changing substance and becomes visible in response to the environmental stimulus. It will be appreciated by one of ordinary skill in the art that, alternatively, the shape element 22 may include ~~with~~ the appearance changing substance and become ~~becomes~~ invisible in response to the environmental stimulus.

Please replace paragraph 0036 (page 11, line 21 through page 12, line 2) with the following amended paragraph:

[0036] In one embodiment of the present invention, the ~~plurality of~~ internal components 16 generate ~~generates~~ an environmental stimulus in which the shape element 22 responds. Alternatively, the ~~at least one~~ resistive element(s) ~~element~~ 18 is energized to generate a thermal stimulus to ~~[[in]]~~ which the shape element 22 of the outer visible surface 14 of the housing 12 responds.

Please replace paragraph 0037 (page 12, lines 3-12) with the following amended paragraph:

[0037] As an example, the shape element 22 can be composed of a color changing ink. The color changing ink can change from one color to another, or alternatively can change from colored to clear. The color changing ink can be thermochromic, which changes ~~change~~ color in response to temperature fluctuations, or photochromic, which responds ~~respond~~ to variations in exposure to UV light (primarily sunlight). Both materials are reversible and will change colors over and over again with the appropriate exposure. Alternatively, the color changing ink can be hydrochromic, which changes color in response to water, or piezochromic, which changes color in response to pressure. Further, the color changing ink can be electrochromic, which changes color in response to the presence of a voltage.

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Please replace paragraph 0039 (page 12, line 22 through page 13, line 5) with the following amended paragraph:

[0039] FIG. 6 is a cross sectional view of one embodiment of the housing 12 of the portable electronic device 10 of FIGs. 1-5 in accordance with the present invention. As illustrated, the housing 12 is composed of an outer layer 28, an inner layer 30, and an enclosed volume 32 arranged between the outer layer 28 and the inner layer 30. Preferably, the outer layer 28 preferably is composed of transparent materials to provide a visual path to the enclosed volume 32. The inner layer 30 can be either transparent or opaque in accordance with the present invention.

Please replace paragraph 0040 (page 13, lines 6-15) with the following amended paragraph:

[0040] In one embodiment, the enclosed volume 32 comprises a plurality of fiber optics, such as described in United States Patent No. 5,087,906, issued February 11, 1992 to Eaton et al., and entitled titled "Selective Call Receiver Having a Light Channel for Providing a Visual Alert," which patent is assigned to the assignee of the present invention[[,]] and ~~which is~~ incorporated by reference herein. For example, the enclosed volume 32 can include a light channel, such as a fiber optic cable. The light channel can comprise a variety of sizes and lengths without deviating from the intent of the invention. The light channel is illuminated using a light source positioned at one end of the light channel. The light from the source then can travel at a predetermined wavelength(s) to maximize diffusion of the light source.

Please replace paragraph 0041 (page 13, line 16 through page 14, line 2) with the following amended paragraph:

[0041] The enclosed volume 32 preferably holds at least one fluid 34 and at least one decorative substance 36. In one embodiment, for example, the enclosed volume 32 contains multiple colored fluids. Alternatively, the enclosed volume 32 can contain two or more immiscible liquids to create wave effects or any other liquid based dynamic decorating technique. The at

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~~least one decorative substance(s) substance~~ 36 can be, for example, a colored dye, a plurality of pearlescent particles, a plurality of light reflecting particles, a plurality of bubbles, at least one free floating solid shape, ~~and at least one decorative substance comprises~~ an immiscible liquid, or any combination ~~thereof therein~~. It will be appreciated by one of ordinary skill in the art that the at least one decorative substance 36 can be any of the substances mentioned herein or an equivalent.

Please replace paragraph 0042 (page 14, lines 3-7) with the following amended paragraph:

[0042] The ~~at least one decorative substance~~ 36 in one embodiment is characterized by a decorative substance viscosity and the ~~at least one fluid~~ 34 is characterized by a fluid viscosity. Preferably, the decorative substance viscosity differs from the fluid viscosity. It will be appreciated by one of ordinary skill in the art that, alternatively, the decorative substance viscosity and the fluid viscosity can be substantially equivalent.

Please replace paragraph 0043 (page 14, lines 8-16) with the following amended paragraph:

[0043] The elements of the enclosed volume 32, in accordance with the present invention, respond to one or more environmental stimuli. For example, in one embodiment of the present invention, the ~~at least one decorative substance~~ 36 moves in relation to the ~~at least one fluid~~ 34 in response to an environmental stimulus. The environmental stimulus can be, for example, an acoustic stimulus, a thermal stimulus, an ultraviolet light stimulus, an electromagnetic stimulus, a mechanical stimulus, or any combination thereof. It will be appreciated by one of ordinary skill in the art that the environmental stimulus can be any of the stimuli mentioned herein or an equivalent.

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Please replace paragraph 0045 (page 14, line 22 through page 15, line 2) with the following amended paragraph:

[0045] For example, when the environmental stimulus is a light, the light interacts with [[the]] at least one decorative substance 36 to create a plurality of visual effects. Further, the light further can interact with [[the]] at least one fluid 34 to create a second plurality of visual effects.

Please replace paragraph 0046 (page 15, lines 3-7) with the following amended paragraph:

[0046] Although the invention has been described in terms of various ~~preferred~~ embodiments, it will be obvious to those skilled in the art that various alterations and modifications may be made without departing from the invention. Accordingly, it is intended that all such alterations and modifications be considered as within the spirit and scope of the invention as defined by the appended claims.